REMARKS/ARGUMENTS

Applicant has received the Office Action dated April 22, 2008, in which the Examiner: 1) objected to the drawings; 2) objected to claims 13, 41, 48 and 54 due to informalities; 3) rejected claims 1-3, 5-11, 13-22, 24-29, 31-39, 41-46 and 48-64 under 35 U.S.C. 102(b) as being anticipated by Peter Newman, Application Outsourcing: the next big thing on the internet, Nov. 1999, Ensim, <http://bmrc.berkeley.edu/courseware/cs298/fall99/newman/ensim_10nov99.pdf>(he reinafter "*Newman*"); and 4) rejected claims 4, 12, 23, 30, 40 and 47 under 35 U.S.C. § 103(a) as being unpatentable over *Newman*.

In this response, Applicant amended claims 13, 31, 48 and 54. Based on the arguments and amendments contained herein, Applicant respectfully requests reconsideration and allowance of the pending claims.

I.   DRAWING OBJECTIONS

The Examiner objected to the drawings, stating that figures 1-6 should be designated by a "Prior Art" legend because "only that which is old is illustrated." Office Action, p. 3 ¶ 8. At least because figures 1-6 are described as embodiments of Applicant's invention, the Examiner's request to label figures 1-6 as "Prior Art" is improper. Even if the Examiner believes Applicant's specification only illustrates that which is old, the Examiner should reject the claims rather than object to the drawings. Further, Applicant respectfully disagrees with the Examiner's characterization of the figures as prior art.

The manner in which the virtualized systems and virtualized components are combined with real systems and real components, as well as the particular configuration and interconnection of such systems and components, as shown in figures 1-6, are not taught or suggested by any of the cited prior art. For example, figure 1 illustrates a system that utilizes real computers 62 which are described in the specification (see for example paragraph 0174 of the specification) and explicitly shown in figure 2 as having virtual server machines 83 each with a virtual machine

operating system 84 running thereon in accordance with the independent claims of the present application. Similarly, and again by way of example, figures 2, 4, 5 and 6 each show a combination of virtualized servers, each of which has its own operating system, with different virtual servers assigned to different customers of the operator of the real computers that are used to host the virtual servers. The implementation of multiple virtual servers using virtual machines each of which has its own operating system, and that are each assigned to different customers that access the servers over a real network, is not taught or suggested by the cited art. Further, figures 4, 5 and 6 illustrate several sets of virtual servers (each set assigned to one of a plurality of customers) implemented using virtual machines and that are made accessible over a real network. Such a configuration of virtual machines for use over a real network is also not taught or suggested by the cited art. For at least these reasons, Applicant respectfully requests that the objections to the drawings be withdrawn.

II.   CLAIM OBJECTIONS

The Examiner objected to claims 13, 41, 48 and 54 due to the use of quotation marks in these claims (the term "intellectual property").[1] Merely to expedite prosecution, Applicant has deleted the quotation marks in claims 13, 31, 48 and 54. For at least these reasons, Applicant requests that the claim objections be withdrawn.

III.   § 102 REJECTIONS

The Examiner rejected claims 1-3, 5-11, 13-22, 24-29, 31-39, 41-46, 48-74 as being anticipated by *Newman*. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be

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[1] Applicant assumes the Examiner intended to reject claim 31 rather than claim 41 as indicated. See Office Action dated 04/22/08, page 3, item 10.

shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1, in part, requires "a real computer, operated by a computer service provider and coupled to a real network, on which is set up at the request of each of a plurality of customers of the computer service provider at least one virtual machine for each of said customers" and "said at least one virtual machine for each of said customers comprises a specification specified by and configurable by the respective customer, and further comprises a separate operating system running thereon". *Newman* does not teach the above limitations. In *Newman*, "private servers" are described rather than "virtual machines" as in claim 1. One of ordinary skill in the art would understand that *Newman's* private servers are not virtual machines and are not implemented using virtual machine technology. Applicant recognizes that determining the scope of different types of virtualization can be confusing. For example, *Newman* states that each private server behaves like a real machine. See slides 15 and 16. However, similar statements could be used, and indeed often are used, to describe any degree of virtualization and do not prove *Newman* teaches "virtual machines", which is a term of art.

Applicant has already discussed similar confusion during the prosecution of the present case and has clarified the scope of the term "virtual machine" in the claims, specification and prosecution history. In particular, in the Advisory Action of February 8, 2006, the (original) Examiner referred to US-A-2001/0011304 ("*Wesinger*") and noted that *Wesinger* uses terms such as "virtual server". This was addressed by Applicant in the Additional Remarks which were filed with the Request for Continuing Examination on April 20, 2006. The (original) Examiner then cited *Wesinger* in the Office Action of June 28, 2006. Again, *Wesinger* was fully addressed by Applicant in the response filed on September 5, 2006 where, in for example the paragraph spanning pages 12 and 13 of the response, Applicant pointed out that "the 'virtual web servers' taught by Wesinger <u>do not run separate</u>

<u>operating systems</u> and are therefore not actually 'virtual machines' as that term is used in the present application. Although the virtual web servers of Wesinger run side-by-side within the real machine, they do not run separate operating systems. In contrast, the present claims require that each virtual machine have 'a separate operating system running thereon.' Because Wesinger does not disclose multiple virtual machines, each running a separate operating system, Wesinger does not anticipate the present claims." The present Examiner is also referred to the response filed on January 12, 2007 to the Office Action of November 13, 2006 and the Pre-Appeal Request For Review dated March 8, 2007 in which this same point is discussed.

The current citation of *Newman* in the Office Action of April 22, 2008 is in this sense *precisely* the same as the previous citation of *Wesinger* in that the document has been cited because it uses language such as "virtual server", which has led the respective Examiners to the erroneous conclusion that *Wesinger/Newman* discloses the use of (true) virtual machines to implement their virtual servers. It has been shown previously by Applicant that *Wesinger* does not disclose the use of (true) virtual machines. This difference has been accepted by the Office because the Decision of the Panel on the Pre-Appeal Brief Review dated March 21, 2007 was that the rejection in the Office Action of November 13, 2006 was withdrawn, that rejection being that the claims were anticipated by *Wesinger*. The Examiner's current position in connection with the disclosure of *Newman* is identical to the previously withdrawn rejection and thus the rejections based on *Newman* should likewise be withdrawn.

To bring out the difference between different types of virtualization and to ensure that it is well understood that the present invention uses "true" virtual machines, Applicant has already amended its claims to require that <u>each</u> virtual machine has "a <u>separate</u> operating system running thereon". In slides 15 and 16, *Newman* shows private server blocks with the label "OS" in each block and thus

Applicant can appreciate there being confusion regarding whether *Newman* teaches a separate OS for each private server. Applicant submits that *Newman's* private servers only *appear* to have separate operating systems. One of ordinary skill in the art would understand this distinction. To support this clarification, Applicant has attached a copy of a subsequent PowerPoint presentation dated August 2000 and authored by Peter Newman, which does not have the label "OS" in the private servers and instead describes private servers by explicitly stating "One OS image appears to be many" in slide 9. Peter Newman, Outsourcing Intranet Application, Hot Interconnects VIII, August 2000 at www.hoti.org/archive/hoti8papers/014.pdf (See Appendix). This is understood by Applicant to reflect the fact that the use of the label "OS" in the private servers in *Newman* (the 1999 presentation) was recognized by Newman to be misleading and that his 2000 presentation more accurately shows that the private servers do <u>not</u> actually have their own operating systems and that it merely "appears" that they have their own operating systems. The reference to "one" OS "image" in the 2000 presentation demonstrates this because it will be understood that the "one" OS is the operating system of the underlying real computer, and the use of the words "image" and "appears" shows that the private servers do not actually have their own separate operating systems running thereon.

It is noted that both of the PowerPoint presentations by Newman mentioned above contain very little technical detail on how the private or virtual servers are set up and operated. The Examiner is therefore referred to two patents of Ensim Corporation in particular, Ensim Corporation of course being the company behind the Newman presentations and the other two documents cited in the Office Action. These patents are US6976258B1 and US6948003B1 which were filed on November 30, 1999 and March 15, 2000 respectively (i.e. around the time of the Newman presentations discussed above and prior to the present application). These patents discuss in detail the technical aspects of Ensim's "private" or "virtual" servers and

show clearly that virtual machine technology is <u>not</u> used to implement Ensim's virtual servers.

Accordingly, Applicant submits that the private servers disclosed in *Newman* (the 1999 presentation) only *appear* to have separate operating systems and are not the same as Applicant's claimed "virtual machines", which actually have a <u>separate</u> operating system running on each virtual machine. For at least these reasons, claim 1 and its dependent claims are allowable over *Newman*. For much the same reasons as given for claim 1, independent claims 20, 37 and 54 as well as their dependent claims are allowable over *Newman*.

IV.   § 103 REJECTIONS

The Examiner rejected dependent claims 4, 12, 23, 30, 40 and 47 as obvious over *Newman*. To support the obviousness rejection, the Examiner alleges that Applicant has admitted the limitations of these dependent claims are conventional and well known. Applicant has made no such admission. In responding to the previous Office action dated 09/27/07, Applicant argued that the cited references at least did not teach the limitations of the independent claims and thus claims 4, 12, 23, 30, 40 and 47 were allowable for the same reasons.

"Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known." MPEP § 2144.03. At least because the limitations of claims 4, 12, 23, 30, 40 and 47 are directed to features of a "virtual" network or a "virtual" storage subsystem, Applicants submit that it is improper for the Examiner to take official notice. At least *Newman* does not teach these limitations. Also, claims 4, 12, 23, 30, 40 and 47 depend from independent claims 1, 20 and 37 and are allowable for the same reasons. For at least these reasons, claims 4, 12, 23, 30, 40 and 47 are allowable over *Newman*.

Further, it is improper to use *Newman* in an obviousness rejection because *Newman's* private server virtualization is incompatible with "virtual machines". For example, a virtualized private server cannot run a virtual machine without being a virtual machine (*i.e.*, the principle of operation of the private server would be improperly modified). The virtual private server technology of *Newman* and Ensim Corporation is a <u>complete</u> virtualization technology, requiring modifications to the operating system of the underlying real computer, use of appropriate pointers within the underlying real computer, etc., all as discussed at some length in the Ensim patents mentioned above. Virtual machine technology is also a <u>complete</u> virtualization technology but one that operates in an entirely different manner than *Newman's* virtual private server technology. Thus, it is improper to use *Newman* in an obviousness rejection. See MPEP § 2143.01, section VI.

V.   CONCLUSION

In the course of the foregoing discussions, Applicant may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the cited art which have yet to be raised, but which may be raised in the future.

Applicant respectfully requests reconsideration and that a timely Notice of Allowance be issued in this case. It is believed that no extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required (including fees for net

addition of claims) are hereby authorized to be charged to Conley Rose, P.C.'s Deposit Account No. 03-2769/1821-01100.

Respectfully submitted,

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ATTORNEY FOR APPLICANT

ensim
instant infrastructure for application hosting

Outsourcing Intranet Applications

Peter Newman

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ensim ## Outsourcing Intranet Applications

- Outsourcing
  - The Challenge: Scaling the Infrastructure
  - A Solution: ServerXchange
- Intranet Applications
  - What are Intranet Applications?
- How?
  - DSL
  - VPNs

ensim   Outsourcing — A Cry for Help

*In sooth, I know not why I
am so sad:
I.T. wearies me...
And such a want-wit I.T.
makes of me,
That I have much ado to
know myself.*

**Source: A Merchant of Venice**
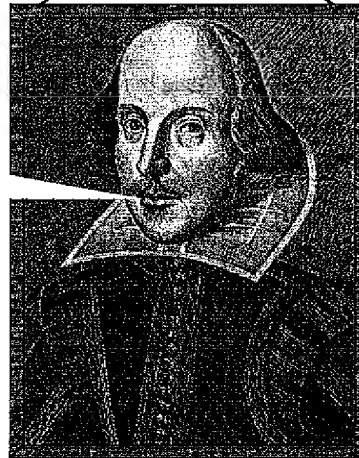
ensim   Do-It-Yourself Sys Admin

Problems:

- Installation

- Updates

- Hardware failure

- Backup

- Incompatibilities

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Outsourcing Applications

1) Remove the IT management headache from the enterprise

2) Concentrate the problem at the service provider

3) Solve the problem at the service provider

Enterprise
Network

Service
Provider

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ensim
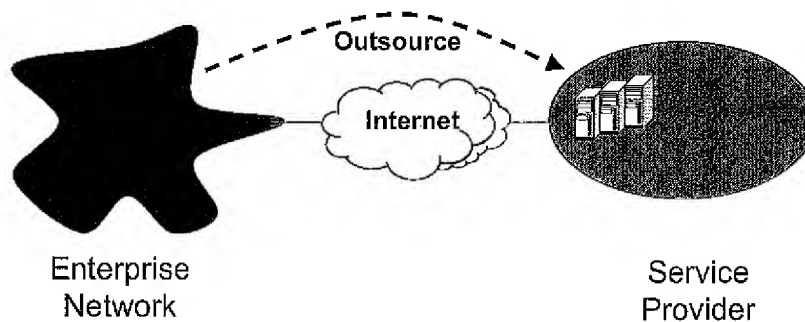
# What's Holding Us Back?

Two key challenges:

- ■ Scalability
  - − Thousands of customers
- ■ Profitability
  - − Per square foot of data center rack space
  - − Per employee

"Every time a service provider adds a new server, it adds
management complexity and, therefore, cost to the environment.
By the time the provider has 1,000 servers running VPNs and
messaging applications for 1,000 different customers it has a
management morass."

*Summit Strategies
May 1999*

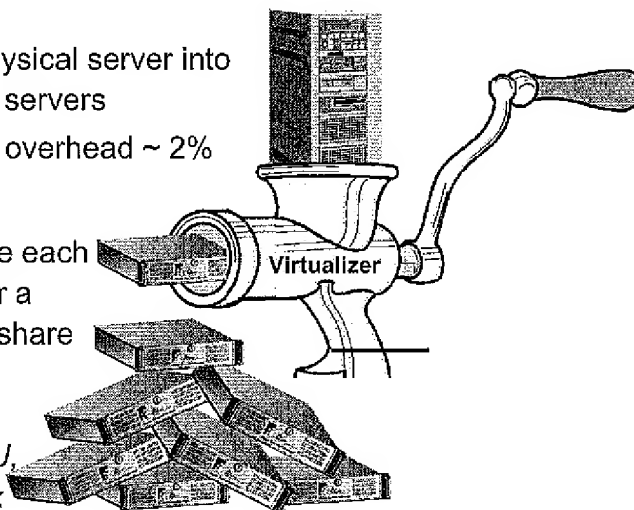## We've Been Here Before
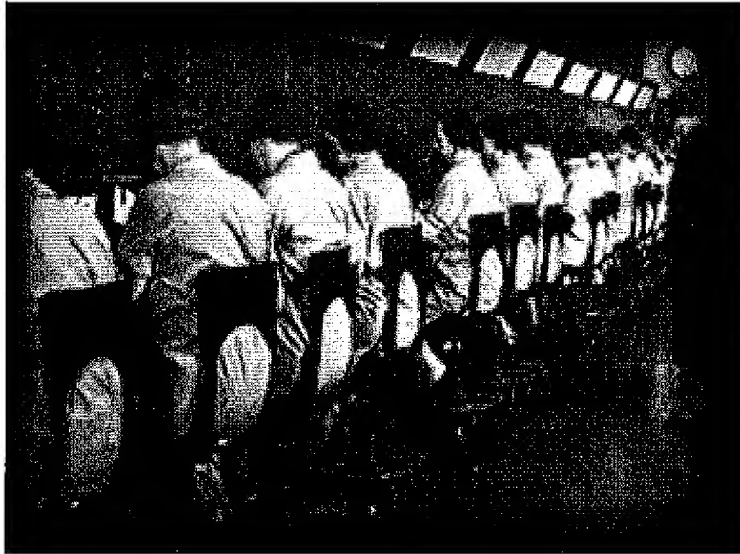
Core Technology

■ Virtualization
- Partition a physical server into many private servers
- Virtualization overhead ~ 2%

■ Scheduling
- But guarantee each private server a configurable share of physical resources: *network, CPU, memory, disk*
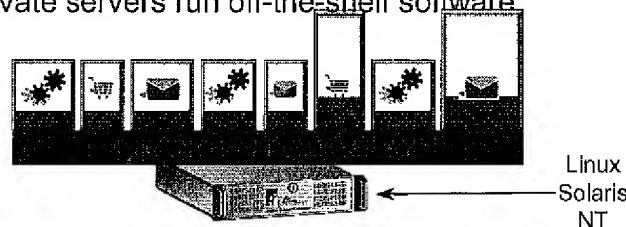
ensim
Private Servers

- Virtualize OS to create *Private Servers (PS)*
  - One OS image appears to be many
  - Each PS is isolated from others
  - Each PS behaves like a stand-alone server
  - Each PS has its own IP address and port numbers
- Quality of Service
  - Each PS is guaranteed a share of:
    CPU, disk space, memory, and network bandwidth
- Private servers run off-the-shelf software

Private Servers

Linux
Solaris
NT

ensim
Ensim ServerXchange

- Monitoring, statistics, billing interface
- Repository for all configuration information
- Restores failed private servers
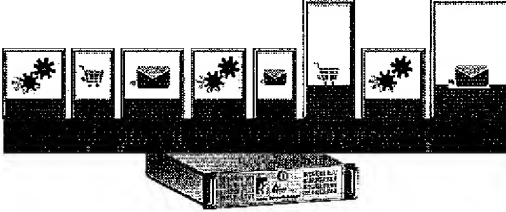- AppXchange: Portal for delivery of updates and new applications

ServerXchange™

AppXchange™

Rack of Servers
Linux or Solaris

Private Servers

Applications

ensim
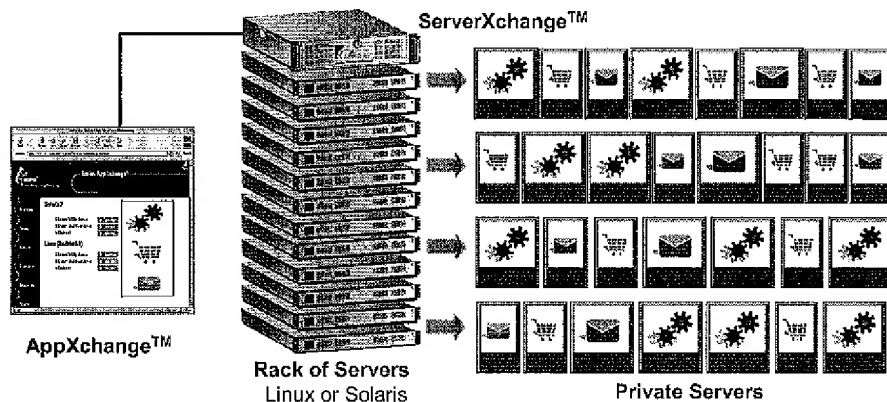
- Apache
- FrontPage Extensions
- Sendmail
- POP3/IMAP
- Log Analyzer
- proFTP
- Telnet
- Perl
- Python

- Secure Shell
- MySQL
- Melange Chat
- WWWboard Discussion Forum
- Webcal
- PHP

- Lotus Notes
- Outlook Server
- Quicktime Video Server
- Planet Intra
- Majordomo

- Miva Merchant
- Miva Empresa
- Intershop
- SSL for Apache
- Bind DNS Server

Application Service Providers

ensim

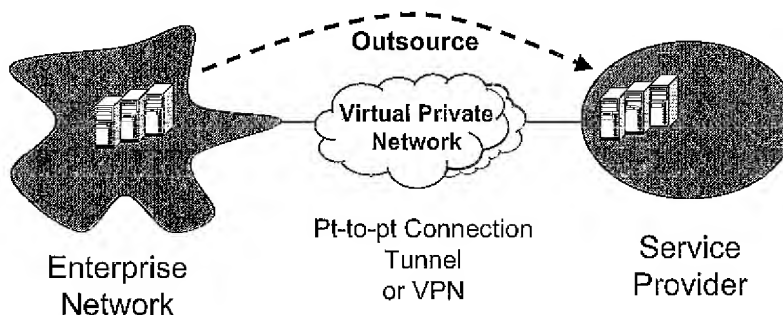|	Portal ASP	Web-Host ASP	High-End ASP
Customer Size:	<10 employees	10-500 employees	>500 employees
App Source:	Home-Grown	ISV	Partner
Servers:	Shared	Shared/Dedicated	Dedicated
Access:	Public (Internet)	Public/Private	Private
Cost:	Free	Low	High
Apps:	Office Productivity	Web hosting, messaging, Ecommerce, collaboration	Large-Scale Business Apps
ASPs:	Onvia, HotOffice, Intranets, Biztro...	*Watch This Space*	Corio, USi, Oracle online...

ensim **The DSL Services Opportunity**

- DSL broadband access is popular with small to mid-size businesses (SMBs)
- Outsourcing is most relevant to SMBs
- *So offer application services directly or partner with an ASP*
- But DSL supports private connections (or VPNs)
- With configurable Quality of Service
- *So offer private application services — Intranet Outsourcing*

"Don't just offer them bandwidth, offer them services too."

ensim **Private Application Services**

- Secure — Not accessible from the Internet or other customers
- Server appears to be on customer's LAN
- Server uses IP address from customer's private address space
- Application services need not be web enabled
- *Not just outsourcing the application but the server too!*

Outsource

Virtual Private Network

Enterprise Network

Pt-to-pt Connection Tunnel or VPN

Service Provider

ensim   Which Private Applications?

Public/Private

- ✓ ✓ Web hosting
- ✓ Messaging
- ✓ E-commerce
- ✓ Collaboration
- ✓ Office Productivity
- ✓ Project Management
- ✓ Enterprise Resource Planning
- ✓ Accounting
- ✓ Payroll
- ✓ Inventory Management
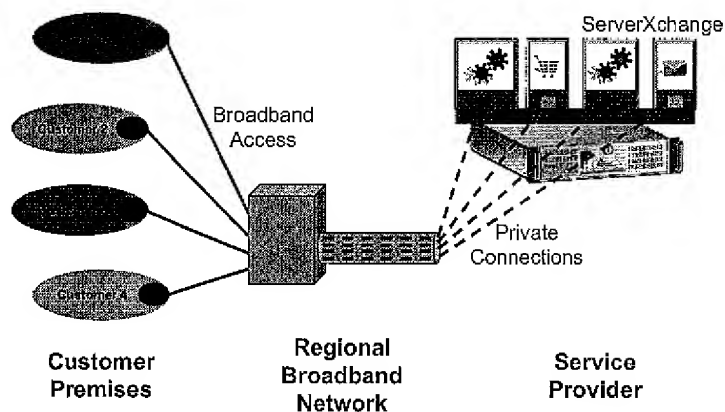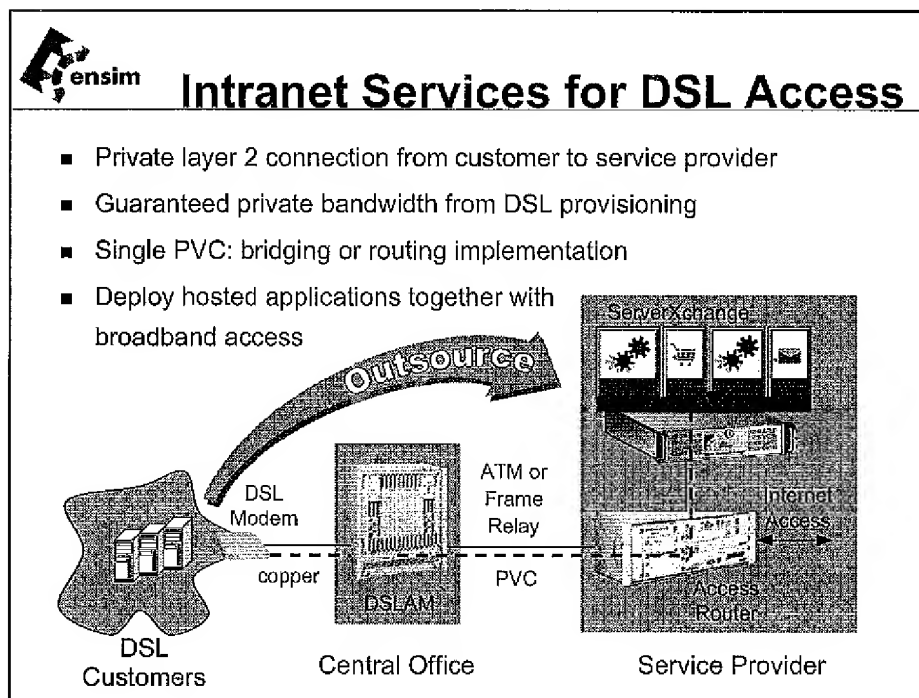- ✓ Order Entry Management
- ✓ Human Resources

Public/Private

- ✓ Procurement
- ✓ Supply Chain Management
- ✓ Sales Force Automation
- ✓ Customer Relation Mgt
- ✓ Database Marketing
- ✓ Expense Reporting
- ✓ ✓ Conferencing
- ✓ ✓ Database
- ✓ ✓ Video Streaming
- ✓ WAP Server
- ✓ ✓ Voice over IP
- ✓ Audio Broadcast
- ✓ ✓ Multiplayer Games

ensim   Outsourcing Intranet Services

- ■ Private servers with private access from the customer's intranet
- ■ Private servers appear on the inside of the customer's intranet
- ■ But are physically located in regional data center

ServerXchange

Broadband
Access

Private
Connections

Customer
Premises

Regional
Broadband
Network

Service
Provider

ensim
Virtual Private Network

- Virtual Private Network for multiple customer locations or multiple service providers
- VPN = Virtual routers, Metro VLANs, Private bridge groups IPSec tunnels, MPLS

ServerXchange

Service Providers

Broadband Access

ServerXchange

Virtual Private Networks

Customer Premises

ensim
Intranet Services for DSL Access

- Private layer 2 connection from customer to service provider
- Guaranteed private bandwidth from DSL provisioning
- Single PVC: bridging or routing implementation
- Deploy hosted applications together with broadband access

Outsource

ServerXchange

Internet Access

Access Router

DSL Modem

copper

ATM or Frame Relay

PVC

DSLAM

DSL Customers

Central Office

Service Provider

Summary

- Don't just sell them bandwidth, sell them hosted applications too!

- Because services = high-margin revenue

- *The Challenge:* Scaling the infrastructure to serve many small business customers

- *The Opportunity:* Private Intranet services delivered via private DSL connections

- *The Result:* High-margin revenue

Infrastructure for Application Hosting

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